

A NEW VIOLIN.

The accompanying illustration represents an improvement in violins, violas, violoncellos, and similar stringed instruments, and recently patented in the United States and the leading foreign countries by Professor Bruno E. Wollenhaupt, of No. 1837 Madison Avenue, New York City.

The appearance of the instrument is the same as that of the ordinary violin, but within its body is arranged an auxiliary vibrating device sounding sympathetically and in unison with the outside strings when the latter are played on by the bow. Only those parts of the auxiliary vibrating device are sounded as are tuned in harmony with the corresponding main strings when the latter are played on. The auxiliary vibrating device consists of twelve metallic strings representing an octave of twelve half tones tuned from C-B, or from G-F sharp, and these strings are stretched longitudinally within the body and can be tuned to the required pitch from the bout by a key, the strings being sounded by means of a short thin stick passed either through the F holes or through openings in the sides of the body; the openings being, however, normally closed by small plugs, as shown in the illustration. A very important feature of the invention is the dampening device, completely under the control of the player, and consisting of a transverse brush or dampening bar supported on a lever pivoted in the body and carrying on its rear end an upwardly extending rod passing through apertures in the top of the body and tailpiece to be engaged at its upper end by a small block held on a flat spring. This block can be pressed by the player's chin to cause a swinging of the lever, so that the brush or dampening bar is moved in contact with all the strings of the auxiliary vibrating device, thus stopping the sounds emanating from the latter. When the player lifts the chin, then the brush falls back to its normal position, that is, out of contact with the vibrating device, and the latter again sounds sympathetically as soon as the outside strings are played on by the bow. Instead of using strings for the auxiliary vibrating device, a metallic comb may be employed, as shown in the smaller figure.

When the instrument is played every tone, from the highest pitch to the lowest pitch, will cause the corresponding auxiliary string, or prong of the comb, to vibrate sympathetically, and, therefore, cause a prolongation and increase in volume of the tone played. All harmonics, natural or artificial, respond and prolong the sound produced by the bow passing over the main strings, but in succeeding chords it is advisable to apply the damper to prevent disharmony.

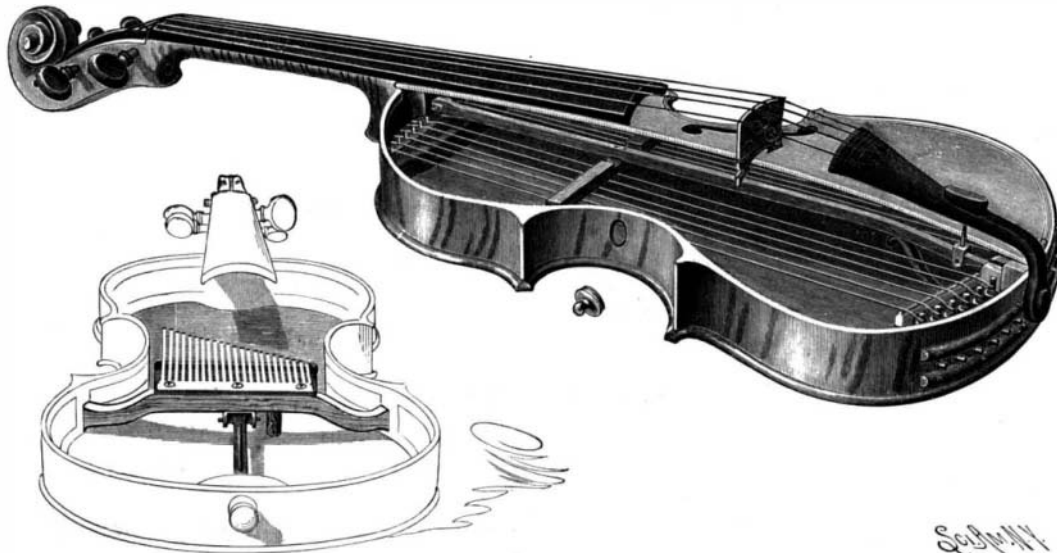
The first violins were built according to Professor Wollenhaupt's invention by the celebrated violin builder, Mr. Geo. Gemmender, Sr., of Astoria, N. Y. During a trip to Europe last summer Professor Wollenhaupt played on his new violin before the king of violinists, Professor Joachim, in Berlin, and this authority speaks in the highest terms of the improvement. A like testimonial is given by Professor J. Von Bermuth, in Hamburg, and Dr. Koenig, in Paris, the well known authority on acoustics, considers the invention a perfect success.

FROM June, 1791, to November, 1813, the French government enrolled 4,556,000 men, nearly three-fourths of whom died in battle, of wounds or of diseases contracted in the field.

astronomy and astro-physics. In our issue of the SCIENTIFIC AMERICAN for January 28, 1893, we gave an account of Mr. Charles T. Yerkes and his gift of the \$500,000 telescope to the University of Chicago. We illustrate herewith the new Yerkes Observatory, which is now being erected at Geneva Lake, after the plans of Henry Ives Cobb, the well known architect of the Fisheries building at the Chicago exposition. The large dome, which has a diameter of about eighty-five feet, will house the great 40 inch telescope. The observing slit will be about fifteen feet wide and ex-

THE YERKES OBSERVATORY—UNIVERSITY OF CHICAGO.

The first University of Chicago closed its work in 1886. Within a few months thereafter Mr. John D. Rockefeller took into consideration the founding of a new institution of learning in that city. Mr. Rockefeller contributed over \$4,000,000 to the new university, and he was followed by Martin A. Ryerson, Sydney A. Kent, Marshall Field, Silas B. Cobb, W. B. Ogden and others. The total gifts to the university since its foundation in 1889 have been between seven and eight

**THE WOLLENHAUPT VIOLIN.**

millions of dollars, or more than the entire endowment and property of some of our Eastern colleges of long standing. The university occupies a large tract of ground between 57th and 59th Streets, Ellis and Lexington Avenues, and is near the South Park station of the Illinois Central Railroad. Some of the university buildings front on the Midway Plaisance, which is so familiar to the thousands of visitors to the Columbian exposition in 1893. On the grounds of the university about forty buildings have been erected, in which the work of the university is carried on. Under the presidency of William R. Harper, Ph.D., D.D., a corps of professors and instructors of high standing were engaged and a large number of students were enrolled. The success of the university has been most gratifying, and a glance at the "Annual Register," which is a model book of the kind, will give an insight into the various courses.

Scientific work of great importance is already carried on at the university, and when the new Yerkes Observatory, situated at Geneva Lake, Wisconsin, shall be completed, unrivaled facilities will be offered for graduate instruction and original research in

tends from the horizon beyond the zenith. The large disks of optical glass were made by Mantois. The clear aperture of the objective is 40 inches, thus making the instrument the largest and most powerful refracting telescope ever constructed. The objective is being made by Alvan Clark & Sons, and Warner & Swasey have already completed the mounting. The mounting is similar to that of the 36 inch Lick telescope, but it is much heavier and more rigid, and many improvements have been introduced. An important feature, employed in this telescope for the first

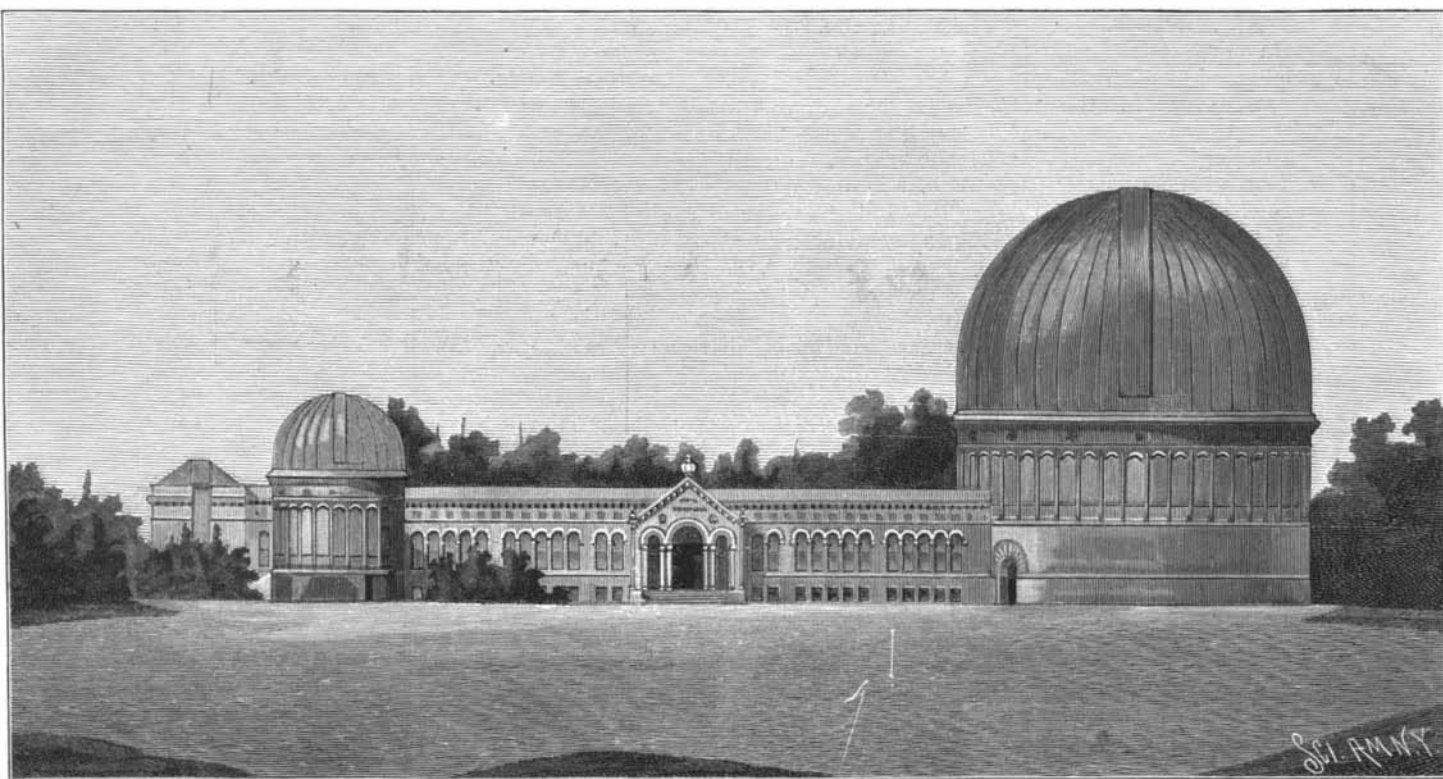
time, is a system of electric motors, by which the various motions, etc., are operated. It will be possible for an astronomer, at the eyepiece end of the telescope, or in any part of the observing room, by simply touching buttons in a small keyboard, to (1) clamp in declination; (2) give slow motion in declination; (3) give quick motion in declination; (4) clamp in right ascension; (5) give slow motion in right ascension; (6) give quick motion in right ascension; (7) stop or start the clock; (8) open or close the shutter of dome; (9) cause the dome to revolve; (10) cause the floor to rise or fall. The declination circle can also be read at the eye end, and all of the above motions operated, and both circles read by an assistant on the balcony which

surrounds the top of the iron pier. The driving clock is wound automatically by an electric motor. The elevating floor of the observing room, about seventy feet in diameter, will be movable through a range of about twenty-five feet by means of hydraulic rams.

The spectroscopic attachments of the 40 inch telescope will be three in number: 1. A spectro-heliograph, for photographing the solar chromosphere, prominences and faculae by monochromatic light. 2. A stellar spectroscope, for photographic and visual investigation of stellar spectra, and determination of motion, in the line of sight. 3. A solar spectroscope, for photographic and visual study of solar phenomena. Graduate students in astronomy and astro-physics will be given an opportunity for study and investigation in the observatory under the guidance of the astronomers. Undergraduate instruction in astronomy will be given in the University in Chicago. Until the completion of the observatory, students will do work as heretofore in connection with the Kenwood Observatory.

Archæological Discovery in Jerusalem.

Dr. Bliss and Herr von Schick, of the Palestine Exploration Fund, write that the iron-bound door of Neby Daud, which had remained open against the wall for a number of years, having been recently blown down during a severe storm, there was discovered on one of the stones behind it an inscription which seems not to have been before noticed. It is in Latin, and is a votive tablet to Jupiter on behalf of the welfare and greatness of the Emperor Trajan and the Roman people, erected by the Third

**THE YERKES OBSERVATORY, UNIVERSITY OF CHICAGO—HENRY IVES COBB, ARCHITECT.**

Legion, which takes us back to the interval between the destruction by Titus and the founding of Ælia Capitolina. It was partly concealed with plaster, and may have been entirely covered when the door was last opened and shut, which may account for its having been unnoticed. It is built into the modern wall about fifteen feet above the ground. Roman inscriptions are very rare in Jerusalem, and this discovery is therefore of exceptional interest.

THE first British steamboat, a tug, was built in 1802.